UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
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June 10, 2019

Brian Nickel
U.S. Environmental Protection Agency Region 10
Attn: Director, Office of Water and Watersheds
1200 Sixth Avenue, Suite 155 (OWW-191)
Seattle, Washington 98101

Dear Mr. Nickel,

Thank you for the opportunity to comment on the Clearwater Mill (CWM) discharge permit biological evaluation (BE) enclosed in your email of April 3, 2018. The BE was originally prepared as part of a request for Endangered Species Act (ESA) consultation for the U.S. Environmental Protection Agency's (EPA) issuance of a National Pollutant Discharge Elimination System (NPDES) permit for CWM. However, NOAA's National Marine Fisheries Service (NMFS) now understands that EPA will not be issuing the permit, as this permitting authority transfers to the State of Idaho in July 2019. Idaho will complete the permitting of CWM. Although there will no longer be a Federal action in this case, NMFS offers the comments below so that EPA can consider these, and we hope, encourage Idaho to address these in the permit. The BE is a long document referencing several other documents that NMFS has not had adequate time to review. It is not clear to us that the permit will sufficiently protect ESA -listed fish, and we have several concerns outlined below.

The proposed NPDES permit for discharge of the CWM into the Snake and Clearwater Rivers includes dozens of contaminants with potential to adversely affect ESA-listed salmonids and their designated critical habitat. The biological opinion (Opinion) that analyzed effects of the 2005 permit (NMFS 2004), remains relevant to many aspects of this proposed permit action, and each of the limits and monitoring requirements in the 2004 Opinion (proposed action and terms and conditions) should be considered for inclusion in the new permit. In general terms, discharge components with the highest risk to listed fish were found to be organic compounds that bioaccumulate within mixtures of interacting stressors and endocrine disruptors. Most of the organic compounds to be discharged in this action have the potential to bioaccumulate and the mixture contains several other contaminants that increase rates of bioaccumulation.

New information from research studies and monitoring indicates several increased risks that were not fully considered in NMFS (2004). These increasing risks are related to a worsening baseline with multiple stressors (warmer water, lower flows); mixtures of endocrine disrupting nutrients, metals, and other contaminants that share additive or synergistic interactions and sublethal effects; and the continued chronic exposure of fish to highly persistent pollutants in water, sediments, and prey. Increased regulation of dioxins/furans, pentachlorophenol, other organic compounds, nutrients, metals, and temperature should be considered.

Temperature

The lower Snake River is water quality impaired for temperature. Washington has issued an exception for the temperature impairment and EPA has withdrawn efforts supporting a total maximum daily load (TMDL). We are concerned that progress may not be occurring in support of beneficial uses, and the present level of impairment will likely worsen with continued climatic warming.

Near-surface water temperatures continue to be warm in the lower Snake River at the head of Lower Granite Reservoir (LGR; PNNL 2006, Figure 5.9; Tiffan et al. 2009). Near the mouth of the Snake River, water temperatures can reach 21–23ºC from surface to depths of 30 feet. Juvenile salmonids often migrate and rear at relatively shallow depths but use deeper water for thermoregulation and predator avoidance (Tiffan et al. 2009; Li et al. 2018). Many juvenile salmonids, particularly fall Chinook salmon, remain in the Clearwater-Snake confluence area for relatively long periods of time, often moving upstream and among varying depths of water while rearing (Naughton et al. 2004; Tiffan et al. 2009; Tiffan et al. 2016). Most smolts slow downstream migration at the head of LGR, likely from reduced current. Juvenile fall Chinook salmon overwinter in LGR and other lower Snake River reservoirs and are present in pelagic and deep-water habitats at least from July through February (Tiffan et al. 2009; Li et al. 2018; Gottfried et al. 2011). Adult steelhead and other gravid adult salmon, stage and hold from weeks to several months within the mixing zone area (Falter and Ringe 1974). Although instantaneous maximum temperature of discharge at the diffuser is reduced by diverting Clearwater River water for premixing with effluent before discharge, the total heat-load contribution of CWM to the impaired temperature of the lower Snake River would not change. During times of reduced mixing, the mixing zone is expected to be much longer and more highly concentrated than estimated because it is trapped primarily within one river plume, not the total of both combined. The colder Clearwater River plume does not mix well through several run-of-the-river reservoirs downstream.

Climate warming has increased water temperatures throughout the life-cycle range of Snake River salmonids. Properly functioning water quality and riparian vegetation increases ecosystem resilience to warming. The dozens of combined stressors from pulp mill discharge on top of degraded water quality (temperature, flow, DDD, DDE, dioxins, etc.) increase the impacts of multiple stressors (Baldwin et al. 2009; Naik and Jay 2011; Gandar et al. 2017). The Clearwater-Snake River confluence at the head of LGR is a critical reach of low survival (Naughton et al. 2004; Erhardt et al. 2018; Connor et al. 2015; Tiffan et al. 2016). There are few trees or shading vegetation for miles of shoreline along the entire lower Clearwater River and eastern and northern shores of the Snake River. Water temperatures of the Snake River are negatively correlated with survival of upstream-migrating adult salmon (Keefer et al. 2008; Caudill et al. 2013; NMFS 2016). Water temperature should be reduced in the confluence area from early spring to late fall. The mixing zone dynamics and sedimentation patterns of discharge from CWM outfall 001 should be investigated at different flows and mixing patterns. Given newer information, after the 2004 Opinion and 2005 permit, that shows both an adverse trend in temperature and clarifies the appreciable negative effects of temperatures in the Snake River on salmon, the new CWM 10-year permit should require a decrease in the present heat load from CWM. Related to but broader than the CWM permit, we recommend that EPA work with Idaho

and Washington to develop waste load allocations and TMDLs for temperature in the Snake River.

Persistent Organic Compounds

Dioxins, DDT, and organochlorides are discharged by CWM into degraded baseline conditions in the Clearwater and Snake Rivers. Sediments of the lower Columbia River and estuary are increasingly loaded with these contaminants from upstream areas (Hinck et al. 2006; Johnson et al. 2006; Yanagida et al. 2012; Alvarez et al. 2014). Substantial adverse effects to ESA-listed salmonids are caused when degraded environmental baselines are further contaminated (NMFS 2004). These fish feed on prey that are likely feeding on contaminated total suspended solids (TSS) (organic matter, detritus, nutrients) that are discharged from the CWM. Year-round dietary uptake, sediment and waterborne concentrations should be considered for rearing fall Chinook salmon, which greatly increases risk of chronic exposure and bioconcentration that were not fully considered in the BE (EPA 2018, Figure 5.1, p. 7-4). Toxicant burdens in fish flesh are common in the Snake and Columbia Rivers and to avoid harm to sensitive humans, may be eaten only on a limited basis. Flesh of resident and migratory fish in the lower Snake and middle Columbia Rivers is contaminated with 4,4'-DDE, 4,4'-DDD, hexachlorobenzene, dieldrin, toxaphene, T-PCB, dioxin/furans, mercury, and others (Seiders et al. 2007, 2011; Arkoosh et al. 2011; Nilsen et al. 2014; Nilsen et al. 2015), and the CWM discharges most of these toxicants to these receiving waters. These substances require stricter management of maximum loads to protect ESA-listed salmonids and achieve reductions in fish body-burdens, water, and sediments of the Snake and Columbia Rivers.

The lower Snake River is water quality impaired for dioxins/furans, DDD/DDE, PCB, and other organic compounds. Although there is a dioxin TMDL (1991) it was prior to the ESA-listings of salmonids, and we are very concerned that these compounds are not being adequately reduced in the Snake and Columbia Rivers. We recommend that EPA work with Idaho to strengthen the limits, beyond what EPA presently proposes for the new permit on dioxins/furans and other organic compounds, to reduce substantial bioconcentration of highly persistent compounds that cause substantial adverse effects to ESA-listed salmonids (NMFS 2004).

Similarly, the lower Snake River is water quality impaired for pentachlorophenol (PCP). Following EPA's description of PCP effects, identification, and use of PCP benchmarks is important for sensitive life stages of ESA-listed fish that spend extended periods of time within the diffuser mixing zone and downstream areas. Gametes of gravid females and male fish staging to spawn are at risk, along with developing Snake River fall Chinook subyearlings that rear from March–May and many that later overwinter near the diffuser. Sediments dredged from the mixing zone and downstream areas are disposed in-river for use as shallow water habitat and islands, thereby potentially increasing chronic exposure and risk. Particularly concerning to NMFS are the adverse impacts of PCP in reducing juvenile feeding, prey capture, and survival at very low levels. It should also be noted that PCP may bioaccumulate in fish eggs and embryos (Maenpaa et al. 2004) and is an endocrine disruptor (Zha et al. 2006) that may cause reproductive impairments in the amounts and concentrations discharged by the CWM. The BE used 0.18 micrograms per liter (μg/L) PCP as a direct toxicity benchmark for ESA-listed salmonids and 0.02 μg/L PCP as an indirect toxicity benchmark for prey species. It is important

that Idaho carry these proposed requirements into the new permit; removal or relaxation of these standards would likely result in increased adverse effects on ESA-listed fish.

Metals, Nutrients, and TSS

The lower Snake River is water quality impaired for nutrients and certain metals. The EPA's use of the stricter standards for copper and nickel provides important reduction efforts on salmon and steelhead. However, the permit limits for chromium, cadmium, and arsenic should be reduced when considering mixtures of so many stressors and all forms of exposure (ingestion and contact over several years).

The CWM discharges many heavy metals that are mixed with the compounds listed above. Each metal alone includes adverse impacts to ESA-listed salmonids in receiving waters. However, mixtures of several metals and highly persistent synthetic compounds markedly increase risk to ESA-listed salmonids in receiving waters. These toxicants cause stress and injury in similar ways and together further reduce fish fitness by depleting metabolic energy required for immunity resilience and defense (Christensen 1975; Eisler 1986, 1998; Farag et al. 1998; Hook et al. 2006; Tort 2011; Schreck and Tort 2016; Bakshi and Panigrahi 2018; Picard et al. 2018). Additive and synergistic interactions tend to increase bioaccumulation rates and toxicity (Miao et al. 2015).

The CWM discharges titanium into critical habitat of the lower Snake and Clearwater Rivers. Titanium dioxide is toxic to ESA-listed salmonids and their prey, and it may increase toxicity and bioconcentration of PCP, metals, and other contaminants within the CWM discharge (Federici et al. 2007; Fang et al. 2015; Miao et al. 2015). We suspect that titanium, other metals, and persistent organic compounds (e.g., dioxin) are proportionately included within TSS. We recommend that in the new permit TSS should be reduced compared to what EPA presently proposes, to mitigate adverse effects on ESA-listed salmonids and their prey (NMFS 2004).

Nitrate is an endocrine disruptor that can cause reproductive impairment in fish (Kellock et al. 2018). Chronic, or even acute, exposures during one or more life stages can impair gamete viability or reduce the likelihood or ability of fish to reproduce. Along with dioxins/furans, heavy metals, and nutrients are likely loaded within the TSS. The nutrients and other chemical inputs contaminate water, sediments, and prey with greatest impacts likely during low flows from summer through winter. The 2010 amendment to the 2005 permit may not have fully considered these adverse effects that were summarized in NMFS (2004). Absorption of TSS by sediments does not reduce this risk, because the dioxins/furans and heavy metals, are simply loaded within aquatic sediments and ingested throughout food webs (algae, invertebrates, fish, birds, mammals and humans). Pulp mill waste is well-documented to cause unnatural and nonfunctioning coverings of aquatic substrates. Wood fibers and sawdust release tannins/acids, COD, BOD, AOX, metals and other contaminants at substrate surface, which soon alters the physical and chemical composition and function of substrates and sediments. We support the adverse effect conclusions of EPA regarding AOX and agree that whole effluent toxicity testing should be continued in the new permit. Typically, mollusks, snails, and other sensitive invertebrate prey are either contaminated or extirpated from aquatic waste disposal sites, as appears to be the case in the area of CWM effluent. Every few years, channel dredging by the U.S. Army Corps of Engineers redistributes these contaminants to in-river disposal sites

designed to provide additional structural rearing habitat for ESA-listed salmonids; however, the effects of the contaminants in the food web remain and should be reduced in the new NPDES permit.

Air Emissions and Air Quality Effects on Water

The CWM abuts rivers on the north and west that are inside long valleys stretching east, west, south. Emissions releasing chlorine, mercury, and other metals and gases move along valley floors and precipitate these contaminants into critical habitat for salmon and steelhead. Uptake by fish and prey include the sum effects of diet and water exposures from all sources (air emissions, liquid and solid discharges) into critical habitat. The environmental baseline includes emissions and discharges in upwind and upriver areas and states.

In summary, we recommend follow-up between EPA and Idaho and NMFS regarding all of the concerns mentioned above before the permit is issued. As noted above, we have not had time to review the BE and proposed permit in detail; however, our specific concerns addressed in the 2004 Opinion remain, and there has been additional research since that time that is relevant to understanding and addressing lethal and sublethal effects of the CWM effluent on fish and their prey. As detailed in our 2004 Opinion, adverse effects on salmon and steelhead occur from various aspects of the effluent. The 2004 Opinion incorporated requirements to ensure that the take of listed species was better understood and sufficiently reduced. It is important for the new permit to take into account more recent toxicological studies and temperature information and have requirements that better address chronic and incremental inputs that ultimately add to the present stressors on ESA-listed salmon and steelhead.

Please contact David Arthaud, Northern Snake Branch, (208) 883-8747, david.arthaud@noaa.gov if you have any questions concerning these comments, or if you require additional information.

Sincerely,

For Michael P. Tehan
Assistant Regional Administrator
Interior Columbia Basin Office

cc: IDFG – JJ Teare
FWS – Russ McRae
FWS – Christy Johnson-Hughes
IDEQ – John Cardwell
COE – Jesse Granet
COE – Brad Trumbo
NPT – Mike Lopez

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